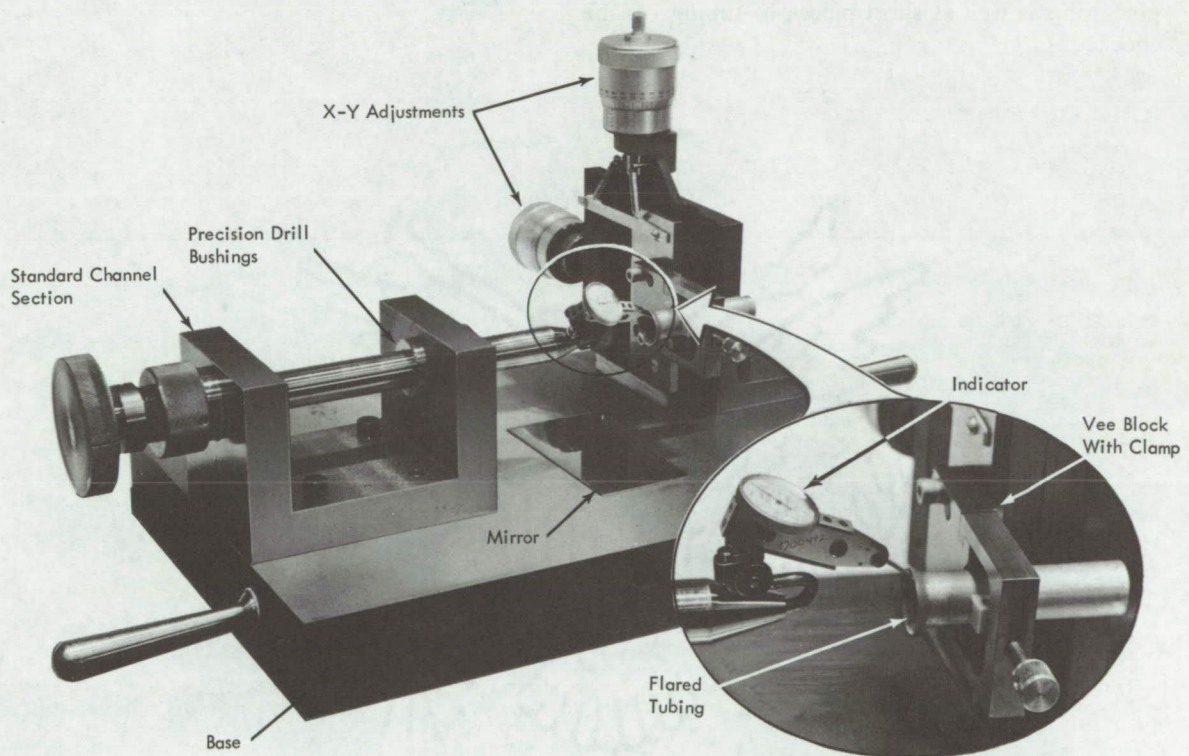


NASA TECH BRIEF



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Mechanical Gage Accurately Checks Tubing Flare, Roundness, and Concentricity



The problem:

To devise a simple means for checking flare roundness and concentricity of metal tubing to an accuracy of 0.0001 inch. Normally this measurement accuracy is only attained by a jig borer or specialized measuring equipment. The availability of these instruments and the required skilled operators are limited.

The solution:

A mechanical gage design from off-the-shelf standard toolmaking supplies that provides the needed accuracy and is easily operated.

How it's done:

The gage consists of a precision ground surface or base, a standard toolmaker's microscope stage with

(continued overleaf)

tenth-reading micrometers on the X-Y table, and precision drill bushings containing a spindle of oil hardened, nondeforming tool steel, ground and lapped, which rotates the indicator.

To use the tool, the tubing is clamped in the V-block so as not to extend more than one-half inch on the X-Y table, and the indicator is rotated on the flare surface. The tube is moved by the X-Y adjustments until the indicator is entered. The indicator is rotated about the flare section and the roundness or Total Indicator Reading (TIR) is taken. Then the indicator is moved to the tube and rotated. The flare reading compared to the tube reading gives an accurate relationship of concentricity.

Notes:

1. Because of the simplicity of this gage, it can be readily used for tube flare verification during production. The gage is horizontal so that with support, long as well as short pieces of tubing can be checked.

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B66-10656

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: L. K. Clark
of International Business Machines
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